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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

WAITS, ALAN B

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/580,609	Applicant(s) TSUJI ET AL.	
	Examiner ALAN B. WAITS	Art Unit 3656	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/23/2007, 8/11/2006 and 5/25/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claim 22 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim shall refer to other claims in the alternative only. See MPEP § 608.01(n). Accordingly, the claim 22 has not been further treated on the merits.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "if the wall thickness at the cylindrical surface of the bush bearing is assumed to be t". It is unclear if this limitation and the ones that follow in claim 1 are necessary or optional, thus rendering the scope of the claim unclear.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3, 6, 12-15 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Hiuga JP 59-212508.

Hiuga discloses a similar device comprising:

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Re clm 1:

- A cylindrical bush bearing whose inner peripheral surface is a sliding surface (Fig 3)
- An outer peripheral surface of the bush bearing has a cylindrical surface and a tapered surface (6, fig 2) interposed between the cylindrical surface and at least one annular axial end face of the bush {an formed by press forming}

The portion of the claim denoted by "{" is a product-by-process limitation. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP 2113.

Re clm 2:

- The tapered surface extends in an axial direction continuously from the one annular end face (fig 3)
- The cylindrical surface extends continuously in the axial direction from the tapered surface toward another axial end surface of the bush bearing (fig 3)

Re clm 3:

- The bush bearing is constituted by a wrapped bush bearing in which a plate (1, fig 2) having the sliding surface on one surface is convoluted into a cylindrical shape (fig 3) such that the sliding surface is positioned on an inner peripheral side (fig 2)

Re clm 6:

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- The tapered surface extends in the axial direction between the cylindrical surface and the one annular end face so as to be flat or convex toward an outside (fig 2)

Re clm 12:

- {the tapered surface is formed by roll forming}

The portion of the claim denoted by "{ }" is a product-by-process limitation. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP 2113.

Re clm 13:

- The outer peripheral surface of the bush bearing further has, in addition to the tapered surface interposed between the cylindrical surface and the one annular end face, another tapered surface interposed between the cylindrical surface and the other annular axial end face of the bush bearing and {formed by press forming} (two tapered surfaces shown on each end of fig 3)

Re clm 14:

- The other tapered surface extends in the axial direction continuously from the other annular end face (fig 3)
- The cylindrical surface extends continuously in the axial direction from the other tapered surface toward the one axial end face of the bush bearing (fig 3)

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Re clm 15:

- The other tapered surface extends in the axial direction between the cylindrical surface and the other annular end face so as to be flat or convex toward the outside (fig 3)

Re clm 21:

- {the other tapered surface is formed by roll forming}

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-3, 6, 11-15, 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiuga JP 59-212508.

Hiuga discloses a similar device comprising:

Re clm 1:

- A cylindrical bush bearing whose inner peripheral surface is a sliding surface (Fig 3)
- An outer peripheral surface of the bush bearing has a cylindrical surface and a tapered surface (6, fig 2) interposed between the cylindrical surface and at least one annular axial end face of the bush {an formed by press forming}

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- The wall thickness at the cylindrical surface of the bush bearing is assumed to be t (thickness of fig 2)
- A difference between a radius at the cylindrical surface of the bush bearing and a radius at an outer peripheral edge of the one annular end face is in a range (fig 2)

Hiuga does not explicitly disclose:

- The range of not less than $0.1t$ and not more than $0.3t$

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide:

- The range of not less than $0.1t$ and not more than $0.3t$

Since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Re clm 2:

- The tapered surface extends in an axial direction continuously from the one annular end face (fig 3)
- The cylindrical surface extends continuously in the axial direction from the tapered surface toward another axial end surface of the bush bearing (fig 3)

Re clm 3:

- The bush bearing is constituted by a wrapped bush bearing in which a plate (1, fig 2) having the sliding surface on one surface is convoluted into

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a cylindrical shape (fig 3) such that the sliding surface is positioned on an inner peripheral side (fig 2)

Re clm 6:

- The tapered surface extends in the axial direction between the cylindrical surface and the one annular end face so as to be flat or convex toward an outside (fig 2)

Re clm 11 and 20:

Hiuga discloses:

- An angle of intersection between the tapered surface and an axial line (angle at bottom of fig 2)

Hiuga does not explicitly disclose:

- The angle is between 15° and not more than 25°

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide:

- The angle is between 15° and not more than 25°

Since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Re clm 12:

- {the tapered surface is formed by roll forming}

The portion of the claim denoted by "{" is a product-by-process limitation. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different

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process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP 2113.

Re clm 13:

- The outer peripheral surface of the bush bearing further has, in addition to the tapered surface interposed between the cylindrical surface and the one annular end face, another tapered surface interposed between the cylindrical surface and the other annular axial end face of the bush bearing and {formed by press forming} (two tapered surfaces shown on each end of fig 3)

Re clm 14:

- The other tapered surface extends in the axial direction continuously from the other annular end face (fig 3)
- The cylindrical surface extends continuously in the axial direction from the other tapered surface toward the one axial end face of the bush bearing (fig 3)

Re clm 15:

- The other tapered surface extends in the axial direction between the cylindrical surface and the other annular end face so as to be flat or convex toward the outside (fig 3)

Re clm 21:

- {the other tapered surface is formed by roll forming}

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8. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiuga JP 59-212508 as applied to claim 3 above, and further in view of Heshmat USP 4277113.

Hiuga discloses all the claimed subject matter as described above.

Re clm 4, Hiuga further disclose:

- a porous sintered metal layer (2, fig 2)
- a sliding layer including a synthetic resin (3, fig 2) with which the porous sintered metal layer is impregnated, and which has self-lubricity and wear resistance
- a portion of said layer which includes said synthetic resin being formed on one surface of the porous sintered metal layer (fig 2)
- {the wrapped bush bearing is formed by convoluting the plate into the cylindrical shape such that the sliding layer is positioned on the inner peripheral side}

The portion of the claim denoted by "{" is a product-by-process limitation. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP 2113.

Hiuga does not disclose:

- The plate is constituted by a multilayered plate which includes a back plate coated with copper

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Heshmat teaches applying a copper layer for the purpose of providing improved bearing load capacity and stability at high temperature and speed (abstract) as well as making it easier to apply lubricant to the surface (col 6, lines 51-54).

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide:

- The plate is constituted by a multilayered plate which includes a back plate coated with copper

for the purpose of providing improved bearing load capacity and stability at high temperature and speed as well as making it easier to apply lubricant to the surface.

Re clm 5, Hiuga in view of Heshmat further discloses:

- The tapered surface is constituted by an exposed surface of copper coating layer (fig 2; Hiuga)

9. Claims 7-10 and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiuga JP 59-212508 as applied to claims 1 and 13 above, and further in view of Sakamaki USP 4561835.

Hiuga discloses all the claimed subject matter as described above

Hiuga does not disclose:

Re clm 7 and 16:

- A smooth circular arc surface is interposed between the tapered surface and the cylindrical surface

Re clm 9 and 18:

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- A smooth circular arc surface is interposed between the tapered surface and the one annular end face

Sakamaki teaches applying smooth circular arc surfaces (36, fig 5) to a sleeve for the purpose of preventing large shear stress discontinuity caused by sharp corners.

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide:

Re clm 7 and 16:

- A smooth circular arc surface is interposed between the tapered surface and the cylindrical surface

Re clm 9 and 18:

- A smooth circular arc surface is interposed between the tapered surface and the one annular end face

for the purpose of preventing large shear stress discontinuity caused by sharp corners.

Re clm 8 and 17:

Sakamaki discloses:

- The smooth circular arc surface interposed between the tapered surface and the cylindrical surface has a radius of curvature (fig 5; Sakamaki)

Sakamaki does not explicitly disclose:

- The radius of curvature which is not less than 0.1 mm and not more than 1.0 mm

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide:

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- The radius of curvature which is not less than 0.1 mm and not more than 1.0 mm

Since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Re clm 10 and 19:

Sakamaki discloses:

- The smooth circular arc surface interposed between the tapered surface and the annular end face has a radius of curvature (fig 5; Sakamaki)

Sakamaki does not explicitly disclose:

- The radius of curvature which is not less than 0.1 mm and not more than 0.5 mm

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide:

- The radius of curvature which is not less than 0.1 mm and not more than 0.5 mm

Since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALAN B. WAITS whose telephone number is (571)270-

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3664. The examiner can normally be reached on Monday through Friday 7:30 am to 5 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on 571-272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alan B Waits/
Examiner, Art Unit 3656

/Richard WL Ridley/
Supervisory Patent Examiner, Art Unit 3656